

Applicant: David Haase, *et al.*  
U.S.S.N.: 10/679,726  
Filing Date: October 6, 2003  
EMC Docket No.: EMC-03-100CIP2

**In the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the Application.

**Listing of Claims:**

1. (Currently amended) In a data storage environment having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as a clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system, a method, operable on a computer system, for managing data content during a restoration of the source, the method comprising the steps of:

restoring the source by copying data content from the clone to overwrite the data content of the source, allowing host reads and writes to the source ~~during the restoration~~;

if preserving the data content of the clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step; and

if preserving the data content of the clone is not selected, then overwriting the data contents of the clone during the restoring step and determining extents of the source affected by any host write request; and

if any extents affected by the host write request are involved during the restoring step in the restoration and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied.

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2. (Original) The method of claim 1, wherein the source and the clone are each represented by respective first and second logical units.
3. (Original) The method of claim 1, wherein a map denominated as a protected restore map is used to track extents of the source that are modified during the preserving step if selected.
4. (Previously amended) The method of claim 1, wherein a map denominated as a clone delta map is used to track extents of the clone that are different between the clone and the source.
5. (Cancelled)
6. (Cancelled)
7. (Cancelled)
8. (Currently amended) A system for managing data content during restoration of data from a second volume of data to a first volume of data, the system comprising:
  - a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system;
  - computer-executable program logic configured for causing the following computer-executed steps to occur:

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restoring the source by copying data content from the clone to overwrite the data content of the source, allowing host reads and writes to the Source ~~during the restoration~~;

if preserving the data content of the clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step; and

if preserving the data content of the clone is not selected, then overwriting the data contents of the clone during the restoring step and determining extents on the source affected by any host write request; and

if any extents affected by the host write request are involved during the restoring step in the restoration and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied.

9. (Previously presented) The system of claim 8, wherein the source and the clone are each represented by respective first and second logical units.

10. (Previously presented) The system of claim 8, wherein a map denominated as a protected restore map is used to track extents of the source that are modified during the preserving step if selected.

11. (Previously presented) The system of claim 8, wherein a map denominated as a clone delta map is used to track extents of the clone that are different between the clone and the source.

12. (Cancelled)

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13. (Cancelled)

14. (Cancelled)

15. (Currently amended) A program product for use in a data storage environment and being for managing data content during restoration of data from a second volume of data to a first volume of data, wherein the data storage environment includes:

a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system; and

the program product includes computer-executable logic contained on a computer-readable medium and which is configured for causing a computer to execute the steps of:

restoring the source by copying data content from the clone to overwrite the data content of the source, allowing host reads and writes to the source ~~during the restoration~~;

if preserving the data content of the clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step; and

if preserving the data content of the clone is not selected, then overwriting the data contents of the clone during the restoring step and determining extents on the source affected by any host write request; and

if any extents affected by the host write request are involved during the restoring step in the restoration and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied.